Space Weather Forecast

Issued on Tuesday, 02 November 2021 at 13:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further moderate-class flares. Slight chance of G1/Minor geomagnetic storm intervals throughout the forecast period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: There are three sunspot regions on the visible disc with moderate solar activity observed over the last 24 hours. The moderate activity was a result of long duration Moderate class flare peaking around 02/0300UT from the region AR2891 near centre disc in the norther hemisphere, which resulted in a new halo CME. AR2887 located toward the southwest limb also produced a long period Common class flare which peaked at 01/2158UTC and produced a CME which may glance earth on the 4th. AR2893 in the northeast quadrant appears stable and benign.

The new halo CME mentioned above has yet to be modelled but is assumed to be earth directed and will be incorporated in subsequent updates when modelling results are known.

Solar Wind / Geomagnetic Activity: Solar wind parameters indicated the connection to the high speed stream from coronal hole 16. Solar wind speeds increased through the period, and are now at elevated levels, with the occasional strong peak. The associated magnetic strength increasing to moderate levels before returning to weak values. The important north-south component varied moderately until around midnight UTC but has subsequently weakened. Geomagnetic activity was initially Quiet, but increased Unsettled to G1/Minor Storm from 01/2100UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained slightly elevated but below minor storm levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to remain mainly low through the next four days, but with a continuing risk of moderate-class flares from the two most complex regions.

Solar Wind / Geomagnetic Activity: The high speed stream from coronal hole 16 is expected to continue to influence earth on days 1 and 2. Further CMEs may glance the earth on days 2 and 3, although these are considered to be low probability. A new halo CME, associated with the Moderate class flare from 2891 around 02/0300UTC has yet to be modelled but is assumed to be earth directed and will be incorporated in subsequent updates when modelling results are known. Unsettled geomagnetic conditions are forecast to predominate through the next four days. There is a slight chance of Active or G1/Minor Storm intervals through the forecast period, due either to the high speed stream, CME effects, or combinations of these events.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be below storm level with a general decrease towards background

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levels.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	20	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	30	20	20
Very Active	R3 to R5 X	No	5	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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